

D. Remarks

The claims are 1, 7 and 9, with claims 1 and 9 being independent. Figs. 1A-1D and 2 have been amended to remove the designation "Prior Art" for the reasons discussed below in connection with allegedly admitted prior art. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claims 1, 7 and 9 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious in view of the admitted prior art shown in Figs. 1 and 2 and discussed in the specification. The grounds of rejection are respectfully traversed.

Prior to turning to the merits of the rejection, Applicants would like to briefly discuss some of the features and advantages of the presently claimed invention. That invention, in pertinent part, is related to a method of making a mold for a microlens having a desired radius (R) of curvature and a method for making the microlens using the mold. In either method, the mold is formed by electroplating on the conductive substrate over an opening formed by an insulating mask, such that the electroplated material reaches a minimum radius R of curvature (R_{\min}) before the desired radius is reached. Importantly, a diameter or width (ϕ) of the opening is $10\mu\text{m} \leq \phi \leq 0.35R$.

When the opening diameter or width does not meet this criteria, substantially different results are produced. For example, when ϕ is less than $10\mu\text{m}$, a plated layer is semispherical from the onset of the electroplating process, and its radius of curvature steadily increases. However, it takes time to reach the desired radius R of curvature, particularly when this radius is relatively large. When the opening diameter ϕ is larger than $0.35R$, R_{\min} that is formed following the disappearance of the flat portion is

larger than the desired radius R. Therefore, it is not possible to form a lens of a desired radius of curvature according to the claimed process.

The Examiner based the outstanding rejection on the disclosure in the specification, particularly at page 7, lines 17-24, alleging that this disclosure is admitted prior art. In accordance with M.P.E.P. § 2131, Applicants submit that the disclosure in the specification at page 7, lines 17-24, is based on Applicants' own work performed during the process of making the present invention, which does not qualify as prior art under any part of 35 U.S.C. § 102. *See Reading & Bates Construction Co. v. Baker Energy Resources Corp.*, 223 U.S.P.Q. 1168, 1172 (Fed. Cir. 1984) ("[W]here the inventor continues to improve upon his own work product, his foundational work product should not, without a statutory basis, be treated as prior art solely because he admits knowledge of his own work. It is common sense that an inventor, regardless of an admission, has knowledge of his own work.").¹ In that connection, Figs. 1A-1D and 2, which are related to the disclosure at page 7, lines 17-24, have been amended to remove the legend "Prior Art". Thus, the disclosure in the specification at page 7, lines 17-24, and Figs. 1A-1D and 2 cannot be used as prior art to reject the present claims.

Japanese Laid-open publications cited in the specification at page 6, line 22, through page 7, line 7, do not disclose or suggest the subject matter discussed at page 7, lines 17-24, or recited in the the present claims. At most, these Japanese Laid-open

^{1/} Applicants would like to thank the Examiner for discussing this issue with Applicants' undersigned attorney on or about July 9, 2008. As advised by the Examiner, Applicants have now specifically pointed out that the disclosure in the specification at page 7, lines 17-24, is based on Applicants' own work and is not prior art. Also, as suggested by the Examiner, the Japanese Laid-open publications mentioned in the specification at page 6, line 22, through page 7, line 7, are discussed.

publications disclose electroplating over an opening in an insulating layer to form a mold for a lens. However, none of these documents discloses or suggests electroplating over an opening with a diameter or width (ϕ) such that $10\mu\text{m} \leq \phi \leq 0.35R$ or recognizes the problems discussed in the specification on page 7, line 8, through page 8, line 25, if electroplating is not performed in that manner. Also, the concept of plating through R_{\min} is not disclosed or recognized.

The Examiner has alleged that there does not appear to be any unexpected benefit associated with the recited numerical value range for the opening over which electroplating is done. Applicants respectfully disagree.

Electroplating as claimed provides unexpected benefits. When the opening diameter or width does not meet the claimed criteria, substantially different results are produced. For example, when the opening diameter ϕ is less than $10\mu\text{m}$, a plated layer is semispherical from the onset of the electroplating process, and its radius of curvature steadily increases. However, it takes time to reach the desired radius R of curvature, particularly when this radius is relatively large. Thus, plating over a larger opening as claimed accelerated mold formation.

Furthermore, when ϕ is larger than $0.35R$, R_{\min} that is formed following the disappearance of the flat portion is larger than the desired radius R . Therefore, it is not possible to form a lens of a desired radius of curvature according to the claimed process, i.e., the upper boundary of the range provides a critical parameter for carrying out the claimed process, which parameter is neither disclosed nor suggested by the prior art.

The unexpected advantages of the claimed range, and especially the criticality of the upper boundary of the range, render the optimization analysis inapplicable

to the present claims. Regardless, the Board of Patent Appeals and Interferences has recently reiterated that “[o]ptimization of a known result-effective variable in a given range is generally obvious . . . only when it is reasonably expected that an improvement will arise in that range.” *Ex parte Atkinson and Benedict*, BPAI Appeal No. 2007-3900 (December 18, 2007) (emphasis added). Thus, in order to establish a *prima facie* case that it would have been obvious to routinely experiment to optimize the diameter or width (ϕ) of the opening such that $10\mu\text{m} \leq \phi \leq 0.35R$, the Examiner has to show that one skilled in the art would have expected to achieve an improvement in that size range. The Examiner has not done so. In fact, the Examiner explicitly stated on page 2 of the Office Action that there do not appear to be any unexpected benefits associated with the range.

Wherefore, allowance of the claims and expedient passage to issue are respectfully requested.

Applicants’ undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

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